

Bonutti is directed to an expandable cannula. As the Examiner notes, Bonutti discloses that the cannula can include tethering cords that limit the expansion of the cannula. Bonutti, Col. 10, Lns. 40-42. In all embodiments, these tethering cords extend from the cannula inner wall to the cannula outer wall. For example, with respect to the embodiment identified by the Examiner, cannula 162 includes an outer wall 164, an inner wall 168, and a plurality of tethering cords 172 that “extend between the inner wall 168 and the outer wall 164, and limit movement of the outer wall 164 from the inner wall 168.” *Id.*, Col. 10, Lns. 62-68.

In contrast, independent claim 57 now recites that the cannula includes an array of filaments which is enclosed by a sheath and extends between axially opposite end portions of the sheath. Independent claim 66 as filed recited that the cannula includes a sheath which at least partially encloses an array of filaments which extends between axially opposite end portions of said sheath. As found throughout the specification (*see e.g.* Pg. 38, Lns. 4-ff), cannula 400c includes an elastic sheath 402c that encloses wires 404c. The wires are longitudinally extending, *i.e.* they extend from one end of the sheath to the other end. One of the advantages of this arrangement is that items inserted into the central passage of the cannula contact the radially inward surfaces of the wires, thereby providing a non-wearing, slippery engagement. Pg. 12, Lns. 23-ff. As the tethering cords of Bonutti are for limiting the expansion of the cannula, there is no motivation to modify Bonutti to obtain the cannula of claims 57 and 66.

In light of the foregoing, independent claims 57 and 66 are respectfully submitted to be patentable over Bonutti. As claims 58-62, which depend from claim 57, and claims 67-71, which depend from claim 66, necessarily include all the elements of their respective base claim, Applicants respectfully submit that these claims are also allowable over Bonutti at least for the same reasons.

U.S. Patent No. 4,716,901

Claims 57-61, 65, and 74 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,716,901 to Jackson (“Jackson”). Although Applicants disagree with this rejection, claim 74 has been canceled in order to expedite the prosecution of this case. Furthermore and for the reasons set forth below, Applicants respectfully submit that claims 57-61 and 65 are not taught or suggested by Jackson.

As previously noted, claim 57 now recites that the cannula includes an array of filaments

which is enclosed by a sheath and extends between axially opposite end portions of the sheath. The analysis of Jackson in the Office Action properly omits any reference to filaments as Jackson does not teach or suggest this feature. Accordingly, Applicants respectfully submit that claim 57 is patentable over Jackson. As claims 58-61 and 65, which depend from claim 57, necessarily include all the elements of their base claim, Applicants respectfully submit that these claims are also allowable over Jackson at least for the same reasons.

Conclusion

Applicants acknowledge with appreciation the Examiner's statement that claims 64, 72, 73, and 75-79 would be allowable if rewritten in independent form to include all of the elements of the base claim and any intervening claims. Applicants have amended these claims as required by the Examiner. Applicants note that the amendment to claim 77 addresses the indefiniteness rejection. Accordingly, Applicants respectfully submit that claims 64, 72, 73, and 75-79 are now allowable.

In light of the foregoing remarks, this application is now in condition for allowance and early passage of this case to issue is respectfully requested. If any questions remain regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

A fee of \$252.00 for six additional independent claims (at small entity rate) is believed to be due with this submission and a Fee Transmittal Sheet including this fee is submitted concurrently herewith. However, please charge the required fee (or credit any overpayments of fees) to the Deposit Account of the undersigned, Account No. 500601 (Docket no. 780-A02-003-2).

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'P. D. Bianco', with a stylized flourish at the end.

Paul D. Bianco, Reg. # 43,500

Enclosures

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Marked-Up Copy of the Amended Specification Paragraph

The specification was amended as follows, with additions underlined and deletions in brackets:

Page 1, Before Line 1 (added in Preliminary Amendment)

--This application is a continuation of U.S. Patent Application Serial No. 08/470,142 filed June 6, 1995 (now U.S. Patent No. 6,338,730). The aforementioned application Serial No. 08/470,142 is a continuation-in-part of U.S. Patent Application Serial No. 08/254,368 filed June 6, 1994 (now U.S. Patent No. 5,573,517). The aforementioned application Serial No. 08/254,368 is a divisional of U.S. Patent Application Serial No. 08/013,942 filed February 4, 1993 (now U.S. Patent No. 5,320,611). The benefit of the earlier filing dates of the aforementioned U.S. patent application Serial Nos. 08/470,142; 08/254,368; and 08/013,942 is hereby claimed for all subject matter common to this application and the aforementioned applications.--

Marked-Up Copy of the Amended Claims

The identified claims were amended as follows, with additions underlined and deletions bracketed:

57. (Amended) An expandable cannula which is movable into a patient's body tissue, said cannula comprising a tubular sheath leaving a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which the passage through said sheath has a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which the passage through said sheath has a relatively large cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath, said sheath having an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the contracted condition; and an array of filaments which is enclosed by said sheath and extends between axially opposite end portions of said sheath.

64. (Amended) An expandable cannula [as set forth in claim 57 further including] which is movable into a patient's body tissue, said cannula comprising a tubular sheath leaving a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which the passage through said sheath has a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which the passage through said sheath has a relatively large cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath, said sheath having an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the contracted condition; and a variable volume chamber connected with said sheath and movable into the patient's body tissue with at least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward [form] from a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.

72. (Amended) An expandable cannula [as set forth in claim 66 further including] which is movable into a patient's body tissue, said cannula comprising a tubular sheath which at least partially encloses an array of filaments which extends between axially opposite end portions of said sheath, said sheath and said array of filaments being resiliently expandable from a contracted condition in which said sheath and said array of filaments have a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and said array of filaments leave a relatively large cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath; and a variable volume chamber connected with said sheath and insertable into the patient's body tissue with at least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward from a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.

73. (Amended) An expandable cannula [as set forth in claim 66] which is movable into a patient's body tissue, said cannula comprising a tubular sheath which at least partially encloses an array of filaments which extends between axially opposite end portions of said sheath, said sheath and said array of filaments being resiliently expandable from a contracted condition in which said sheath and said array of filaments have a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and said array of filaments leave a relatively large cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath, wherein said sheath has a pointed end portion for piercing body tissue when said sheath and array of filaments are in the contracted condition.

75. (Amended) An expandable cannula [as set forth in claim 74 wherein said pointed end portion is] which is movable into a patient's body tissue, said cannula comprising a tubular sheath having a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which

said sheath and passage have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and passage have relatively large oval cross sectional sizes in a plane perpendicular to the longitudinal central axis of said sheath, and a pointed end portion at least partially formed by said sheath for piercing body tissue when said sheath and passage have the relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath.

77. (Amended) An expandable cannula [as set forth in claim 73] which is movable into a patient's body tissue, said cannula comprising a tubular sheath having a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which said sheath and passage have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and passage have relatively large oval cross sectional sizes in a plane perpendicular to the longitudinal central axis of said sheath, and a pointed end portion for piercing body tissue when said sheath and passage have the relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath, wherein said passage in said sheath is engagable by a member having an oval cross sectional configuration in a plane extending perpendicular to the longitudinal central axis of said sheath, said member having an oral cross sectional configuration being axially movable along said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

78. (Amended) An expandable cannula [as set forth in claim 74 further including] which is movable into a patient's body tissue, said cannula comprising a tubular sheath having a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which said sheath and passage have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and passage have relatively large oval cross sectional sizes in a plane perpendicular to the longitudinal central axis of said sheath, and a pointed end portion for piercing body tissue

when said sheath and passage have the relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath; and pump means connected in fluid communication with said passage in said sheath, said pump means being operable to provide fluid pressure which is applied to said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

79. (Amended) An expandable cannula [as set forth in claim 74 further including] which is movable into a patient's body tissue, said cannula comprising a tubular sheath having a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which said sheath and passage have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and passage have relatively large oval cross sectional sizes in a plane perpendicular to the longitudinal central axis of said sheath, and a pointed end portion for piercing body tissue when said sheath and passage have the relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath; and a variable volume chamber connected with said sheath and movable into the patient's body tissue with at least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward from a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.